



## **Northern Hemisphere atmospheric stilling amplifies lake thermal responses to warming**

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Climate change, in particular the increase in air temperature, has been shown to influence lake thermal dynamics, with warming resulting in higher surface temperatures, stronger stratification, and altered mixing regimes. Less-studied is the influence on lake thermal dynamics of atmospheric stilling, the decrease in near-surface wind speed, observed in recent decades. Here, using a one-dimensional lake model to simulate the thermal behaviour of lakes across the Northern Hemisphere, we show that lake thermal responses to warming have been amplified as a result of atmospheric stilling. Specifically, lake surface temperatures and stability have changed at an average respective rate of 0.32 and 0.24°C per decade from 1980-2016, with atmospheric stilling contributing 15 and 30% of the observed changes, respectively. Our results demonstrate that atmospheric stilling has influenced lake thermal responses to warming. The future evolution of near-surface wind speed is therefore pertinent to assessment of future climate change impacts on lake ecosystems.